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Diagnose Network & App Performance Issues

Monitor Every Facet Of Your Data Center To Zero In On Specific Problems

Efforts to diagnose and solve network and application performance problems can be tedious, especially if they don't occur on a consistent basis. But if you put preventive strategies and technologies in place, troubleshooting will be less stressful.

Establish A Process

When it comes to performance issues at any level of your data center, the worst thing you can do is react to problems as they occur.

Jean-Pierre Garbani, vice president and research director at Forrester, says companies shouldn't deploy an application until they have the necessary monitors in place to make sure it will function properly and that IT operations can detect and solve any problems.

"Establish an incident and problem management process," Garbani says. "Who gets alerted? What do they do? To whom do they forward the problem? How is it corrected?"

Know Key Indicators

When you're trying to diagnose specific application or networking issues, time will be one of your best indicators. "From the network, you have the possibility to understand when a transaction comes in and when the answer goes out," Garbani says.

You can run diagnostic tests by sending packets throughout your network, into applications, and wherever else you think necessary. By measuring how much time it takes for that information to transfer, you should be able to determine where your latency or processing issues are originating.

If application performance issues are the symptoms, then capacity could be one of the root causes. For instance, with a network, it could be something as simple as "someone watching a basketball game on the LAN and sucking all the bandwidth," he says. On the server and compute side, an employee could unexpectedly spin up too many virtual servers and eat up resources. And when it comes to storage, Garbani says that it can come down to how a database is configured physically on disk.

Consider A Comprehensive Management System

Mark Tauschek, principal consulting analyst at Info-Tech Research Group, says although

it's important to monitor the end-user experience and listen to feedback, "by the time you hear it from them, it's too late to be proactive." A better approach is to use a comprehensive systems management solution or a network management system (NMS). "A good NMS or systems management solution is going to allow you to drill down and find the root cause much more quickly," Tauschek says.

Troubleshoot The Layers

When going through the troubleshooting process, start at the bottom layer and work your way up. "You start at layer one, which is physical," Tauschek says. "Make sure that you actually have connectivity whether it's on a wire or with RF being the physical medium. You can use a spectrum analyzer, a port analyzer, or a cable tester."

From there, you get into the second layer where you can look at the network and specific connections. Eventually, you'll get to layers four through seven.

"It's really a process of moving up the stack, and by the time you're up to layer seven, you're really into the granular application level of troubleshooting." At this layer, you're looking at the potential for bad code, a bug in an application, database backend issues, and more. But before you get to the application level, you have to make sure your physical infrastructure and networking components work correctly. P

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It's those types of headaches that the Brady BMP®41 portable label printer helps avoid.

The printer is unique in its ability to print both continuous and die-cut labels, says Matt Luger, Brady's regional product specialist for printers.

The BMP41's ability to print die-cut labels that are pre-cut and pre-spaced inside a cartridge eliminates the time- and money-wasting issues associated with continuous printers while still offering continuous labels for certain applications.

The printer can handle any labeling need, including flags, wraps, strips, and small labels for both indoor and outdoor use. And it is easy to use—it automatically recognizes the label installed and defaults to the correct rotation, format, size, and font, with the ability to override any default settings.

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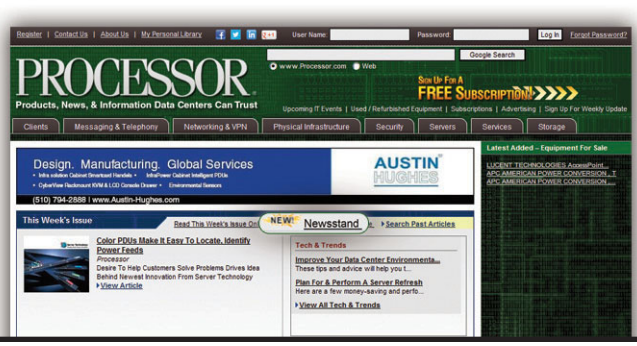

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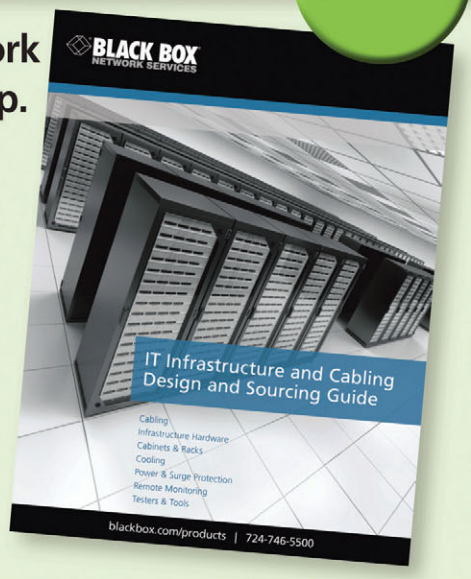

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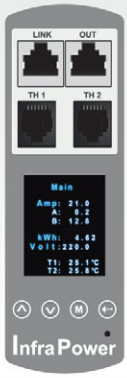

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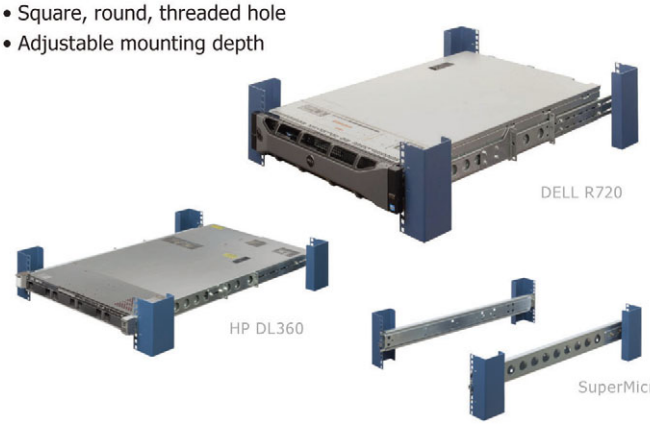

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Business Intelligence, Analytics Remain Top Focus

CIOs recognize the benefits of fact-based decision-making and will continue to focus on business intelligence and analytics through at least 2017, according to research firm Gartner. "As the cost of acquiring, storing, and managing data continues to fall, companies are finding it practical to apply BI and analytics in a far wider range of situations," says Roy Schulte, vice president and distinguished analyst at Gartner.

Gartner has four predictions for BI and analytics:

By 2015, the majority of BI vendors will make data discovery their prime BI platform offering, shifting BI emphasis from reporting-centric to analysis-centric. "It's important to acknowledge that one size rarely fits all," Schulte says, so analyze the road maps of both data discovery and IT-centric vendors.

By 2017, more than 50% of analytics implementations will make use of event data streams generated from instrumented machines, applications, and/or individuals. Gartner reports that a new breed of technologies will be able to quickly produce autonomous insights and inferences.

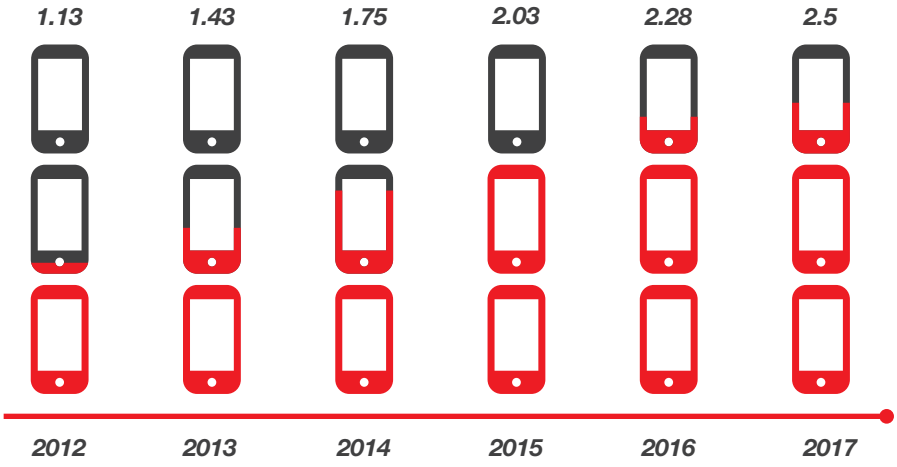
By 2017, analytic applications offered by software vendors will be indistinguishable from analytic applications offered by service providers. Both service providers and software vendors are working to develop packaged expertise and applications, Gartner states.

Until 2016, big data confusion will constrain spending on BI and analytics software to single-digit growth. As the big data market matures, Gartner notes, big data analytics will become more relevant and mainstream.

2014 Global Smartphone Adoption To Total 1.75 Billion

According to a recent report from eMarketer, mobile phone users will continue their rapid transition to smartphones as 3G and 4G network coverage expands and devices become more economical. eMarketer predicts that the worldwide smartphone audience will total 1.75 billion this year and eventually hit 2.5 billion in 2017.

Smartphone Users By The Billions, 2012-2017



Monitor Market Showing Signs Of Recovery

The latest figures from IDC show that worldwide PC monitor shipments were better than expected during the third quarter of last year. During the quarter, manufacturers shipped more than 35 million units, up 4.5% from the previous quarter and 1.2 million more units than originally forecast. However, year-over-year shipments were down 8.6%, primarily because of the continued decline in PC sales. LED monitors and screen widths of 21 inches were most popular. IDC reports that about 136.3 million units shipped during all of 2013, which is down 8.5% compared to 2012. By 2017, monitor shipments will have dropped to about 109.6 million units.

IT Spending To Show More Growth This Year

Global IT spending will increase significantly in this year, with 6.2% growth expected compared to 1.6% growth in 2013, according to a blog post from Andrew Bartels, vice president and principal analyst with Forrester Research. Bartels expects the rise to continue in 2015, with IT spending growing 8.1%. For these projections, Bartels included computing equipment, consulting, and outsourcing in the spending totals and excluded telecommunications purchases. Software, says Bartels, including cloud-based software, is the leading spending category.

Big Data Growth To Outpace Rest Of Market

The big data technology and services market will grow at about a 27% compound annual growth rate between now and 2017. That's about six times the growth rate of the overall information and communication technology market, according to research firm IDC. The cloud infrastructure segment has the highest CAGR, at 49%, IDC reports. In the future, IDC notes that a significant amount of big data will either be disposed of or moved to the cloud, which could result in lower sales of traditional storage to data centers.

Companies Increasingly Rely On Managed Private Cloud Services

As companies realize the limitations of public cloud services, they're increasingly turning to managed private and professional services, according to Technology Business Research. Between the third quarters of 2012 and 2013, the overall managed private and professional services market increased by 43.7%, with revenue up 34.8%. "Organizations are recognizing the limitations and security concerns with public clouds and the complexity of advanced cloud environments, garnering growing customer interest around managed and hybrid clouds," says Cassandra Mooshian, lead cloud analyst at Technology Business Research's Professional Services Practice. Mooshian says successful vendors in the space are tailoring their solutions to better fit the industry, including expanding their partner networks.

Augmented Reality To Facilitate Business Innovation

Garter predicts that augmented reality (AR) will become an important tool for improving workflows that will make an impact on current business operations. AR is ideal for workers in the field, says Tuong Huy Nguyen, principal research analyst at Gartner, but IT organizations can now use AR to "bridge the digital and physical world." Specifically, AR is expected to improve location services and image recognition. Beyond these benefits, AR has the potential to boost productivity, provide real-time access to data, help better visualize problems and solutions in IT organizations, and more, Nguyen says.

Competition, Shipments In Wearable Market To Take Off

As consumer awareness of new wearable technology and product launches heightens, the market will grow rapidly between now and 2018. Juniper Research reports that, by 2018, shipments of wearable devices, including smart watches and glasses, will approach 130 million units—about 10 times higher than current shipments. For now, wearable devices are more of a "nice to have" rather than a "must have," Juniper reports, but that will change as competition and offerings increase. Deployment of wearable devices is currently held back by legal, social, and privacy issues, Juniper notes.

CIOs Feel Unprepared For The Third Era Of Enterprise IT

More than half of CIOs are concerned about how quickly digitization of the enterprise is approaching, according to a Gartner global survey of CIOs. Whereas the first era of enterprise IT focused on automating operations and the second era ushered in industrialization, the third era of enterprise IT will change the core of business and information, thanks to technological trends such as the Nexus of Forces and the Internet Of Things. Although 42% of CIOs "don't feel they have the talent needed to face the future," 77% of CIOs intend to partner with startups and small companies and change their technology and sourcing relationships in the next two to three years.

Consumers Have Conflicting Views Of Mobile Device Privacy, Security

Consumers are centralizing more of their lives around their mobile devices, according to a recent report from eMarketer. Putting such a great deal of sensitive personal and financial information in one place poses risks for both consumers and financial firms, eMarketer notes. But consumers have a conflicted relationship with privacy and security. Although consumers are concerned about security and privacy, there are opposing views of security mechanisms, with some consumers against any security steps that impede their mobile experiences and others viewing security steps as instilling a sense of trust.

Tech Unemployment Averaged 3.5% In 2013

Last year the tech unemployment rate dropped slightly from 3.9% to 3.5% between the final two quarters, finishing with a 3.5% annual average. Although there were no new jobs added to data processing, hosting, and related services in the fourth quarter, unemployment rates for numerous sectors, including software development, Web development, and programming, improved last year. "Recruiting activity for technology professionals continues to be good, but it's not rising evenly. This data just reinforces it's a better job market for developers and data professionals. Those tech professionals can write their own ticket and create the career they want," says Shravan Goli, president of Dice.

Make Sure You're Ready For Software-Defined Storage

Research What It Is & Test Its Possibilities So You'll Be Prepared For The Future

Software-defined storage is a relatively new concept that entered the scene hot on the heels of software-defined networking. Like SDN with networking equipment, SDS aims to make the management of storage solutions much easier.

Even though SDS is far from being a mature technology, you should start researching it in earnest, so you have the knowledge and ammunition you need to be able to decide what role, if any, it will play in your data center's future.

What Is It?

Traditionally, individual storage solutions from different manufacturers have their own separate management software built-in. This means that if you were to install three different types of storage, you would have to contend with three different pieces of software.

Software-defined storage is "fundamentally about abstraction and getting outside the box," says John Sloan, principal consulting analyst at Info-Tech Research Group. The goal is that instead of having multiple software solutions and controllers, you have one central management system and control over every storage device.

Centralized management has several obvious benefits, including increased visibility of available resources to help maximize efficiency, but it also makes it possible to add agility to your infrastructure, improve quality of service, and optimize your storage costs, says Dave Russell, vice president and distinguished analyst at Gartner.

"Many people like to say the goal of SDS is to be cheaper or to run on commodity hardware, and that in fact may turn out to be true, but in my mind there are still going to be valid reasons to have high-priced storage arrays," he says. Possible reasons include resiliency and availability, previous investments, and SDS training. "So I think that it's about cost optimization that ideally lowers cost. This may not mean commodity hardware in all use cases and circumstances."

How Does It Work?

Because software-defined storage is such a new technology, there isn't one clear or "right" way of implementing it. But regardless of what approach you take, the goals should always be somewhat the same.

"A key notion of SDS is trying to get the often opaque and sometimes mysterious domain of storage close to something that is more aligned with the business," Russell says. "In IT terms, the best way to do this is to make storage more application-aware, or application-aligned, so that the right capabilities and services can happen at the right time to the applications data, ideally with less and less human involvement."

But how does a data center actually start that automation process and abstract the management control out of the device? One way is to "virtualize the processor," which Sloan says lets you run the

Key Points

- Software-defined storage (SDS) essentially takes the management function within a storage solution and moves it outside the box.
- SDS may be able to commoditize your storage and make it less costly for future upgrades.
- The maturation of SDS is still a few years away, but start now to research and test.

Get Started

"Companies shouldn't go out to acquire SDS in the same way they would go out and get the cloud," says John Sloan, principal consulting analyst at Info-Tech Research Group. "They have to look at total features and functions and total cost per terabyte. Support will be as important as ever. The buyer will be able to look at what features and functions they are getting for the money on the software side and what capacity they are getting for the money on the hardware side." He adds that storage vendors are wrestling with this because they're used to just selling a box, so make sure your vendor can adequately explain how the software and management work.

virtual controller on a server and "present all the storage that is attached to that server and other servers as one big storage pool."

But this isn't the only approach to SDS. Some companies are actually putting "storage management right into the server virtualization hypervisor, so all the storage those virtualized host servers can see is pooled and managed as if it's a big virtual SAN array." The approach you take ultimately depends on your current infrastructure setup and what type of implementation would cause the least disruption.

The Future Of SDS

Sloan says that any technology that claims to be software-defined is "part and parcel with the cloudy future of the data center." This means that "how fast and how soon it happens depends on how well the storage industry manages the transition and how soon they feel they can let go and still make revenue," he says.

Just as data centers will need to adjust to the new SDS-based future, storage vendors also have to make the adjustment, so the future of the technology will remain unclear until solutions enter the market and mature.

Russell agrees that SDS is still up in the air to some extent and that the real answer as to when SDS will become mainstream "depends on how strictly or loosely you define SDS." There are currently solutions on the market that will enable SDS with a virtual appliance, but they don't necessarily bring that automation and orchestration into play that is a crucial benefit of the technology.

Because of that, Gartner hasn't been "too aggressive" with its projections, Russell says. Gartner expects that this year the SDS marketing hype will increase and definitions will start to mature. In 2017, products will start to solidify until about 2020 when "product adoption and cross-industry collaboration leveraging standards" will emerge. P

Action Plan

Learn. Take advantage of all available information to get a solid understanding of software-defined storage (SDS). Prepare employees for a sizable and fundamental change.

Watch. See how other companies use the technology, read white papers and case studies, and get a grasp of what all goes into an SDS implementation.

Test. Before SDS hits mainstream, you need to start thinking about how it will fit in to your specific environment and set up pilot programs to ensure a smooth transition.

Wait. SDS is not currently a mature technology, so it's important to not jump in right way, but instead wait for multiple solutions to hit the market and then compare them.

Top Tips

Start a pilot program. Dave Russell, vice president and distinguished analyst at Gartner, recommends that while you're "weeding through the hype," you should "also run early pilot projects for non-mission-critical workloads to ascertain cost benefits and gauge organizational readiness for change." You have to prepare your workforce well ahead of time for software-defined storage (SDS) because it will involve "questioning conventional thinking" and "learning newer skill sets," Russell says.

Research, research, research. "Although SDS is nascent, and is far closer to being a concept than a well-defined category of available solutions, the potential for cost improvement and enhanced manageability make the technology something to keep abreast of," Russell says. So even if you aren't quite ready to launch pilot programs, at least start researching the technology so you'll be ready when it goes mainstream.

A simpler definition. John Sloan, principal consulting analyst at Info-Tech Research Group, compares SDS to what has been going on with x86 servers for almost a decade. "In servers, we call it virtualization rather than software-defined, but a virtual server is a server that is defined by software." At its core, you could consider SDS virtualized storage, but the term "software-defined" is used simply to differentiate it from server virtualization.

Assess The Newest Security Threats & Your Risks

Prepare Your Company For A New Generation Of Cyberattacks

Cyber threats are advancing in sophistication faster than most enterprise security teams can prepare for, and this evolution creates increasingly complex security challenges.

Because of this, security officers should not only be aware of advancements in social engineering and other traditional forms of attacks, but they must also anticipate the latest developments on the cyberspace battlefront, such as mobile malware, cloud-based attacks, and BYOD-related compromises. We'll examine some of the newest threats to the enterprise and how you can stay a step ahead of them.

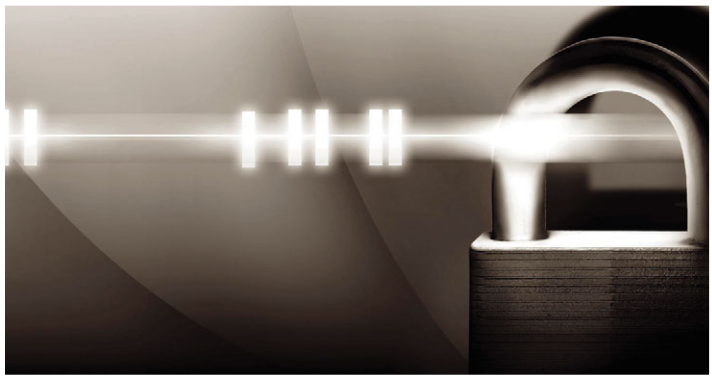
Know Your Enemies

You could easily compile an ever-growing list of the most common threats to the enterprise, but there are plenty of new key threats to pay attention to these days.

Among the more advanced threats are "malware attacks, mobile malware, application-layer attacks targeted at cloud apps, and social attacks, just to name a few," says Amy DeCarlo, principal analyst, security and data center services, at Current Analysis.

"On a broader scale, new attack sources have become more prevalent in recent years as ideologically and politically motivated attacks have increased and advanced persistent threats have become more common," she says.

According to Richard Stiennon, chief research analyst at IT-Harvest, attackers are researching key enterprise personnel and targeting them to get access to their credentials. "Once they have any credentials, they target the Active Directory server. From there, they obtain the keys to the kingdom using pass-the-hash to move laterally toward their targets," he says.



Although you can work to predict the next move of a cyberattacker, it's difficult to brand one threat as the most important among all security threats. "As soon as you say the biggest threat is *X*, along comes some new *Y* and *Z*," says Steve Wilson, vice president and principal analyst at Constellation Research. "In retail, we obviously have this very worrying situation where credit card terminals [at retail locations] have been compromised. That serves as a reminder that mobile devices, too, are vulnerable to take over," he says.

Use Your Team To Monitor & Stay Aware

If identifying every significant threat and hacking trend is next to impossible, what steps can security managers take to build a defense around their enterprise's vulnerabilities?

Wilson says there's only one way: safety in numbers. "Security management has become highly specialized and needs a team approach. Different specialists cover application security, operating system vulnerabilities, network vulnerabilities, and malware of a hundred different

Key Points

- Traditional threats put enterprises at risk, and new mobile, application-based, and cloud attacks are driving changes to enterprise security policies.
- Ensure that you have a security management team that recognizes major vulnerabilities and proactively monitors risks.
- Consider partnering with a larger third-party security firm to reinforce your defenses.

Get Started

According to Amy DeCarlo, principal analyst, security and data center services, at Current Analysis, the challenge for IT managers is not simply the volume of threats, but the evolving nature of threats and the sources of the attacks. To combat these obstacles, you should have a well-stocked toolbox.

"IT managers have a wealth of sophisticated security tools to choose from, but successful security strategy in what are increasingly open enterprises really requires a multilayered approach," she says. This approach incorporates "proven technologies like unified threat management, identity and access management, firewalls, and content security with newer elements in areas like reputation validation."

kinds," he says. "The ability for small enterprise teams to stay up to date is near zero, and it only takes one slip-up to doom a business. So increasingly, enterprises need to look at managed data centers."

Stiennon says that threat evolution has reached a point at which data center managers already assume that attackers will get in if they target the data center's assets. As a manager, you can continuously monitor network and server activity in order to get immediate warning, so you have a chance to prevent damage. "Full packet capture coupled with security analytics is the answer," he says.

Educate Yourself & Rely On Professionals

To play the cybercriminal's game, you unfortunately have to think somewhat like a cybercriminal. "Research into threat actors, their methodologies, and their targets is required," Stiennon says, "[because] the threat is always the same: The attacker will get what they want, which is often not the top-ranked asset in a risk management regime."

Current Analysis' DeCarlo offers similar advice, saying constant user education is key. "Follow the news and keep up with as much of the latest threat information as possible, but really the focus should be on eliminating as many access points as possible without impeding productivity."

Wilson says there isn't any point in cataloging common vulnerabilities, however. "If we wrote about 20 threats, there would be 10 more," he says."My point is that enterprises need to look to the big security and hosting firms and get with the strength. The best chance you have is to leverage the skills and experience of big teams of professionals, working 7x24 on shared infrastructure," he says.

Ultimately, when comparing all available security options, it becomes obvious that there's no easy protection plan. However, you can learn what you're up against, roll out comprehensive monitoring, and utilize a team of experts. P

Action Plan

Expect attackers to know security tactics. It's common knowledge that hackers typically develop a greater understanding of enterprise architectures and adjust their strategies accordingly. You can rely on tried-and-true security procedures but continue to strengthen your enterprise's walls with new, more impenetrable defenses.

Know your weak points. Do you need to beef up your BYOD policy? Are you prepared for ransomware attacks? How visible and controllable are your corporate cloud applications? When you know your vulnerabilities, you can delegate your security team members to address any embedded risks.

Decide where to invest your security budget. Whether you need to hire more employees for your company's own security team or choose a vendor that offers managed data services, be sure to determine where your money will be best allocated.

Top Tips

Take advantage of cyberwarfare intelligence. "IT managers should research the recently published tools that the Tailored Access Operations (TAO) of the NSA have developed," says Richard Stiennon, chief research analyst at IT-Harvest. This is one way to heighten awareness of vulnerabilities in your enterprise.

Enforce the right types of policies. Amy DeCarlo, security and data center services principal analyst at Current Analysis, says we talk a lot about obvious vulnerabilities, however the most serious vulnerabilities are due to "poorly executed or non-existent policies that lead to careless practices." Lost laptops and leaked data are just two common examples.

Assess your needs and act accordingly. DeCarlo says that although you can do your best internally to stay ahead of threats, there are times when it's best to proactively assess your security gaps and rely on a third-party partner.

Secure Your Enterprise From Insider Threats

Increase Awareness Of Potential Attacks & Educate Employees About Vulnerabilities

IT MANAGERS INVEST thousands of dollars worth of resources, not to mention time and collaborative energy, into protecting their enterprise networks and servers from outside threats. Unfortunately, threats and even attacks can occur from the inside, whether they're caused by an employee who makes an honest mistake or a more malicious insider looking to steal intellectual property.

"Outsiders typically gain access to IT environments through compromised endpoints," says Lawrence Orans, research director at Gartner. However, "insiders [gain access] in environments where there is no data loss protection." Even if your enterprise hasn't yet implemented data loss prevention plan, it's never too late to increase employee awareness and implement scheduled auditing practices.

Outside Bad, Inside Worse

In the same way that it's less invasive for a criminal to infiltrate a top-secret organization from the inside as a opposed to penetrating a high-level security barrier from the outside, it's less difficult, in a sense, for an internal employee to compromise sensitive data than for a hacker to independently attack the network.

In fact, Nemertes Research CIO and Principal Research Analyst John Burke says anything an external attacker can do, an internal attacker can do more easily, including stealing or destroying information, disrupting operations, and disabling services. "Insiders can also, intentionally or accidentally, disclose information they should not, open up avenues of attack, or impede efforts to respond to attacks or mitigate risks," he says.

It has become increasingly difficult for enterprises to protect against these types of vulnerabilities simply because of the volume of devices saturating the workplace.

Jeff Clark, president and general manager at Lindy (888/865-4639; www.lindy-usa.com), says technology is moving forward at such a rapid pace that it makes it much more challenging to put in place a protection plan of action.

"For so many years, we have been so focused on protecting ourselves from the outside world, that we have not considered the threats that come from inside. Everything is a mass storage device these days," Clark says. "As storage capacity gets smaller and easier to hide, it is almost impossible to prevent these things from entering your building."

Identify, Make Changes & Protect

Before data center managers can truly enforce new security policies, they must first change their mindset, according to Clark. This happens as managers define the rules and then educate their employees as to how important it is to follow said rules. It's equally important to be aware of the types of mistakes that can lead to a significant data compromise.

"The biggest threat does not come from a person who has malicious intent. It comes from an honest person being careless. It comes from the

Take Stock Of Your Defenses

When it comes to fortifying your enterprise's virtual walls to protect against threats within and without, it's wise to expand one layer at a time so you're prepared with a defense at any point.

"Defense in depth is the key: Use network security at the WLAN edge, the LAN edge, the Internet connection, the data center edge, and among security domains within the data center to incrementally improve security and decrease the risk of attackers getting through undetected," says John Burke, CIO and principal research analyst at Nemertes Research. "And have a consistent plan of response to incidents when detected, including most especially making sure to close (if possible) whatever security gap allowed an attack to succeed."

parent who wants to show pictures of their kids to a co-worker that are stored on their phone. It comes from the employee who sees no harm in removing data from the company on a flash drive to bring home so they can work at night," Clark says.

Unfortunately, there is little you can do in the way of absolutely preventing these types of inside attacks. However, one of the biggest things you *can* do is reduce their impact, Nemertes Research's Burke says.

Burke offers three strategies for mitigating potential internal attacks. First, "do real identity management, ensuring that the only user accounts in the system are associated with actual people (people that are supposed to have accounts) and that no accounts are shared."

Second, Burke says you should ensure there is meaningful, role-based rights management, especially for when employees are both gaining new and losing old privileges with the start of a new position. Third, be sure to audit and monitor the use of admin accounts and admin privileges.

Remind, Test & Reorient

Helping your employees recognize the possibility that they could be the cause of a data leak (even if it's unbeknownst to them) is all about creating awareness, starting with education when an employee is first hired.

Burke says that orientation at hiring as well as quick reminders, mini-quizzes, and occasional full reorientation sessions can serve as a baseline. "Emails from IT with examples of scams recently encountered are good awareness raisers," he says. Use of two-factor authentication is helpful. Also consider white-hat penetration testing with attempted social engineering attacks, he says, as they are an excellent diagnostic tool and a good way to raise awareness.

Enforce Policies & Conduct Reconnaissance

As an employer, you'll need to implement monitoring and reporting techniques while deciding on potential punishments when there are rules violations, Clark says.

"For example, there are reporting mechanisms that can let an IT manager know if a USB port has been accessed," Clark says. "If an incident occurs when it was not allowed, there needs to be some sort of accountability, and some examination of what led up to the incident so that changes can be considered."

Ultimately, employees need to be given concrete examples of scenarios that could happen because a rule was not followed, he says. P

Strengthen Your WLAN

"By dramatically multiplying the number of things that can be compromised, BYOD promises to make inside-based attacks more frequent and more difficult to identify and respond to," says John Burke, CIO and principal research analyst at Nemertes Research.

However, Burke says, wireless LAN security engineering "can dramatically reduce the risk of problems and the scope of impact they can have by limiting the amount of the inside network such devices can see at all."

BONUS TIPS:

You Really Do Need A BYOD Policy

All the talk about bring your own device (BYOD) policies isn't just hot air—devices in the enterprise are here to stay. However, many companies still don't have a BYOD policy, says Jeff Clark, president and general manager at Lindy (888/865-4639; www.lindy-usa.com). "Banks have a lot of personal data, and you can go in just about any bank and [see that] USB ports are accessible to keyloggers. They don't even think about it, but every now and then they will go through an audit and then something gets identified as a vulnerability," Clark says. "By and large companies do not have a policy—government agencies, yes, but private companies don't have a policy. There needs to be an awareness of how vulnerable everyone is."

Practice Security Training

Lawrence Orans, research director at Gartner, says data center managers should implement security awareness training to educate employees. For example, test employees by sending "fake" phishing emails and monitoring who clicks them, he says.

Future-Proof Server Investments

Prepare New & Existing Servers For Long-Term Use

For data centers, companies in the IT industry, and most businesses in general, servers are the foundation and most important components of their overall computing systems.

Servers help employees by providing the necessary computing power and applications for their productivity needs, and servers also help the company reach out to customers quickly and more effectively. They represent the combination of networking, storage, and agility that can help your company reach its desired potential.

Because servers are so essential for businesses, IT managers must understand when it's time to upgrade servers or buy new ones, and as with any IT purchase, the goal should always be to invest in a solution that will give the company the performance it needs for years to come.

The key is to understand when it's time for an upgrade or when you can make tweaks to existing servers. And if you do decide to invest in new servers, you must make sure they have every feature your company and workforce will need for the future.

Here we'll show you a few things to consider when extending the life of your existing servers as well as features to look out for in new servers.

Recognize The Signs That It May Be Time For An Upgrade

The first thing you should do when optimizing servers for the future is to assess the needs of your employees. Look at the overall performance of your servers, including speed and utilization, and then ask company employees if they are noticing any issues.

You should perform a full analysis of your servers to understand potential trouble spots and figure out whether they can be fixed with additional apps and solutions or if new physical infrastructure is needed.

"There are a number of factors that can signal the need; some are obvious, but some are less so," says Dylan Larson, director of platform technology initiatives for Intel's data center group. "Things like utilization rates, user response times, and in some cases, the number of virtual machines that are deployed on servers can point to the overall service quality that users are experiencing with the infrastructure."

One or more of the following symptoms may also indicate that your servers are ready for a upgrade: sluggish operation; unusually noisy fans and/or hard drives; out-of-date warranties; and software that exceeds the server's specifications.

Key Points

- Look for warning signs that it may be time to upgrade your servers. Employees are the best place to start.
- Invest in software, applications, and solutions that will extend the life of your server.
- View servers as long-term investments and make sure they have every feature your company will need for the future.

Invest In Solutions That Will Extend Server Life

If there is a problem with your servers or they aren't providing the performance that your employees need, it doesn't necessarily mean that you need new servers.

There are many solutions available that can extend the lives of servers and prepare them for long-term use. For instance, Larson says, you

Get Started

According to Dylan Larson, director of platform technology initiatives for Intel's data center group, one of the best places to get started when purchasing new, future-proof servers is to look at the cost and energy-saving features. "Customers are becoming increasingly focused on the user experience and total cost of ownership of their infrastructure," Larson says. "It is often the rising cost of power and scarcity of data center space that impact the life of the infrastructure. Companies that invest in advances in power management are seeing improvements in the overall lifetime and effectiveness of their data centers."

can install management infrastructure software that supports power management and metering at the server level.

There is also the possibility your company can take advantage of virtualization on your existing servers. In some cases, virtualized applications and software can be used to free up space on servers and use available resources more efficiently. You can take this approach with new servers, as well, by making sure they can aptly support virtualization.

Important Features Of New Servers

If you do decide it's time to invest in new servers, there are many important features to look at that will future-proof them. Consider efficient, power-saving servers that can help lower energy costs in the short and long term. And some companies are already working on technology to help with energy-related issues.

You should also make sure the servers you choose are scalable for your company. You may be able to invest in servers that will meet your current needs, but they should also be able to evolve with your company. Scalable servers can not only provide the necessary performance in the short term, but also leave room for future customizable options if the need arises.

Always Be Flexible & Prepared For Change

It goes without saying that future-proofing anything related to technology is a difficult task. Even if a company is prepared to the best of its ability, there will always be new challenges to overcome in the future and new technologies to take advantage of. You should regularly assess your company's needs and the performance of your servers.

Try to make small, inexpensive tweaks along the way to avoid potentially costly overhauls. As long as your servers are scalable and customized to your needs, you should be able to adapt and be prepared for the future. P

Action Plan

Know your TCO. Understand the total cost of your infrastructure, including space, power, and cooling, and not just the servers themselves. Over the past several server generations, there have been tremendous gains not only in server performance, but also in energy efficiency.

Make room for more storage. Understand user workload requirements and find servers that can meet those demands. Opt for scalable servers whenever possible so you know you can keep up with your company's growth and ever-changing needs.

Embrace virtual. Explore consolidation opportunities using virtualization technology where it makes sense. It can make it easier to cut costs and free up much-needed resources when you move applications and data to virtualized environments.

Top Tips

Zero in on security features. When looking at your top features for servers, don't forget to put a strong focus on security. The best way to future-proof your servers is to make sure they are protected from internal and external threats.

Do your research. Make sure the servers you invest in are capable of running the applications you want to use and handling the overall traffic of your workforce.

Be a savvy server shopper. Compare the prices of servers and find ones that fit your budget, but don't sacrifice performance for savings. It sometimes takes a larger investment upfront to save money in the long run.

Prepare for incremental upgrades. Always be on the lookout for new server technologies to take advantage of, especially ones that don't require a full server overall. There may be optimization and performance-enhancing applications that can help you get the most out of your existing servers.

Understand & Find Data Center Inefficiencies

Start By Monitoring, Then Take Simple Management & Maintenance Steps

How well do you know your data center? Are your servers being utilized to their potential? Do you have any bypass air, air dams, or other potential airflow issues? Is your cooling equipment properly maintained?

Knowing the answers to those questions and others is a good place to start when working to have a better understanding of your data center and any potential inefficiencies. It's the first step in what's often a never-ending process in making sure you're running the most efficient data center possible when it comes to utilization, cooling, energy efficiency, and more.

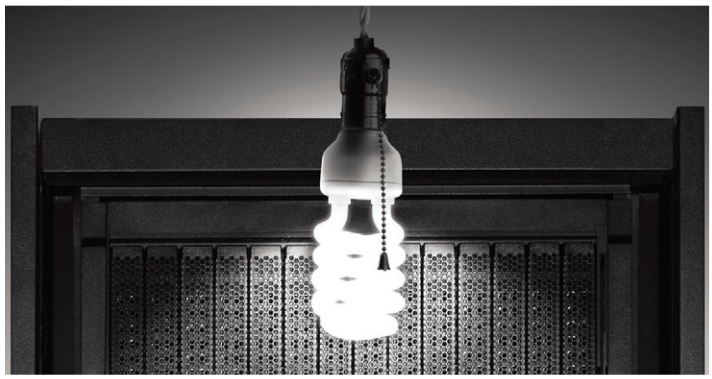
Signs Of Progress

Even though there will always be room for improvement in terms of data center efficiency, we've made great strides in recent years.

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says many of the gains have been the result of simply following best-practice guidelines.

For example, he says, more data centers are using hot/cold aisles, which improve cooling capacity and reduce energy consumption. In addition, stricter cable management of both power and IT cables helps eliminate airflow obstructions, better facility infrastructure maintenance programs keep equipment running at peak efficiency, and the use of brush grommets to seal raised floor cable cutouts and blanking panels in server cabinets helps to limit airflow bypass, thereby improving cooling efficiencies.

Laura Viars, account manager at Rackmount Solutions, says virtualization, consolidation, and the use of liquid cooling and in-row cooling solutions have also brought about efficiency improvements in data centers.



Where To Begin

You can't manage what you don't measure. It's an age-old adage that still rings true when working to improve the efficiency of your data center.

"It is difficult to make energy efficiency improvements if you don't know your current power consumption," Koty says. Quite simply, you need to know the power efficiency of the equipment in your site. Power monitoring systems help you better understand and manage loads and address energy efficiency opportunities, he says.

Viars says there's a lot involved in maintaining maximum data center efficiency. "One key step is to be diligent in monitoring the physical environment, as well as how things are working within it; power consumption and energy efficiency of servers and other equipment; conditions within the racks and the room; and the battery status on the UPSes."

Viars says that if you are not currently monitoring your data center remotely, you should be. "Intelligent monitoring software will help you pinpoint where excess power exists, as well as what areas might be strained for power, which can help you rearrange

Key Points

- Data centers have made great efficiency gains in recent years simply by following best practice guidelines.
- Power monitoring systems can help you better understand and manage loads.
- Legacy equipment can be incredibly inefficient. Compare the energy consumption of old and new equipment to get a true picture of costs.

Get Started

When looking for areas for improvement, start with cooling, which often is the most inefficient aspect in data centers, says Laura Viars, account manager at Rackmount Solutions. "More often than not, improvements can be made to better direct airflow and eliminate bypass air, which helps greatly increase the overall efficiency of the data center."

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says simple things such as dirty cooling towers, heat exchangers, or filters; loose or misaligned A/C unit belts and pulleys; or placement of A/C CRAC and CRAH units in relation to racks and cabinets can impact efficiency.

your equipment in the most sensible and efficient manner."

In addition to monitoring, Koty and Viars say you need to know your inventory and what equipment you have where. Maintaining legacy equipment can be a major source of inefficiency, Viars says.

"Some data center managers are hesitant to replace servers and other pieces of equipment that technically still work, especially when budgets are tight," she says. "However, when you compute how much extra energy they consume in comparison to newer equipment as well as how they stack up in regards to performance, it becomes very apparent that replacing older gear with newer gear when possible is the way to go."

Tools To Help

Anu Elizabeth Cherian, senior industry analyst at Frost & Sullivan, says today's data centers are being managed more efficiently from the start with the help of advanced monitoring software, which is enabled by sensors wired to detect fluctuations in temperature and state of battery health.

Data center infrastructure management (DCIM) software "not only helps address the problem of efficiency, but optimizes total power usage in the data center without compromising on the reliability of systems," Cherian says.

Viars agrees. "DCIM software is essentially the all-seeing eye of data centers; it will catalog and display all equipment within the data center, report usage trends, monitor and report heat loads within the cabinets, and even allow you to determine the effects of making a particular change before you implement it."

But DCIM software is just one tool in an overall efficiency arsenal. Amp and voltage meters are two other good tools, Koty says. Amp meters will measure the power equipment draws to help you identify the least efficient equipment. If you have long power feeds of more than 100 feet, Koty says, a voltage meter can help detect any voltage drops that make it more expensive to power your equipment. P

Action Plan

Know your site's PUE. Measuring the PUE, or power usage effectiveness, is a relatively quick way to determine the energy efficiency of your data center. Monitor power consumption, watching for stranded power or power strains.

Match capacity, demand. There's no need to consistently run at higher capacities in anticipation of infrequent spikes in demand, says Laura Viars, account manager at Rackmount Solutions. For retail and other locations with greater demands at certain times of the year, maintaining the same level of capacity year round is terribly wasteful in regards to energy, she says.

Consider investing in DCIM. Viars says data center infrastructure management software lets you see all conditions within your data center and make more informed decisions. She says there are reports that DCIM can reduce operational expenses by up to 20% and extend the life of equipment and the data center itself.

Top Tips

Walk the floor. "Sometimes, something as simple as walking the raised floor will identify hot spots that may indicate poor underfloor cable management or air leaks in raised floor cutouts," says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com).

Replace inefficient equipment. Look at all existing equipment in your site to determine which pieces are the oldest and least efficient. Koty says. "When replacing equipment, consider replacing the least efficient equipment first." Before purchasing new equipment, Koty says to ask vendors to provide servers for testing and load comparisons before purchasing. "If different brands will do the required work for your company, why not purchase the one that uses the least power. Remember more power consumption also equates to higher cooling requirements."

Consider hiring a pro. Koty says to consider hiring a professional vendor to do an energy evaluation of your site. "In some cases, server equipment vendors will provide this service at no cost to you."

Protect & Manage Unstructured Data

Develop Strategies & Policies, Then Back Them Up With Technology

Most IT administrators have a solid grasp on structured data, which comes from databases, applications, and other primary information sources. But unstructured data can be an entirely new challenge. Rather than relatively easy-to-manage data points and sources, unstructured data sources consist of emails, information stored on private hard drives, and other such items.

You might be surprised to know how much unstructured data you have. Alan Dayley, research director at Gartner, says unstructured data makes up "as much as 80% of an organization's data now, with database and application data only being 20%." And these numbers are expected to rise as "the growth rate of unstructured data is in the 40 to 60% range, whereas structured data is probably closer to the 20% range," Dayley says.

Because the amount of structured data is growing at a fast pace, IT teams are looking for ways to better manage and protect those information sources. There are ways to tackle the issue, some of which involve technology solutions, and others that require strategy and policy adjustments.

Standard Search Engines Won't Cut It

George Goodall, senior consulting analyst at Info-Tech Research Group, says that some people think they can "slap a search engine" on their infrastructure and essentially use a standard, popular search engine.

The problem with this approach is that public search engines are great for finding more general information due to the "very good linking structure on the Web" and the way that search engines essentially rank links based on authority. However, Goodall says that after you find something on the Web, it can be difficult to find that exact same link a few days later.

This doesn't work inside a business because you aren't searching for general topics, but rather for specific sales presentations and other documents. Plus, an intranet search engine wouldn't necessarily be able to spot all types of unstructured data unless it were custom tailored to do so.

"When we look on the intranet side of things, we have very specific user demands, a much smaller collection to search against, and we don't have the linking structure," Goodall says. "Only when we've identified and profiled our information sources as well as identified the information needs of our users can we tune our search engines so that they work."

Use Data Analysis Tools

Dayley recommends companies dealing with unstructured data issues consider implementing data analysis tools that give you a better idea of what data you have and where it is.

He says that these tools "give you a really good visualization of your unstructured data" and they "query all different types of data," whether it be email, file shares, or other sources "and give you good reports around all of the metadata." It goes beyond letting you know who created the file and when by also giving you information such as when it was last touched and what other applications it is tied to, Dayley says.

Use Technology To Back Up Policy

"It's always better to create policies upfront on how you're going to manage [unstructured data] and how you classify information, even before you create it," says Alan Dayley, research director at Gartner. For example, a government agency that contacted Dayley requested advice on how to implement a new infrastructure system that would generate 10 times the amount of data as the old one. Dayley simply helped the agency develop policies from the beginning that would allow it to save space but still get the same performance.

"They wanted to know how to set up the best policies ahead of time so they could categorize information and delete it as they went along to minimize the problem," Dayley says. "The key to this whole thing is upfront policy management with buy-in across the whole organization and executive sponsorship. That's what the most successful organizations are doing."

Data analysis tools also make it easier for IT administrators to present possible strategies to business owners. For example, using data analysis, you can spot duplicate or redundant data, Dayley says. Then, he says, you can dig deeper and identify data that perhaps hasn't been touched for years or belongs to owners that aren't even with the company anymore. Data analysis tools not only help you understand your data better but also let you cut down on the amount of unnecessary unstructured data simply taking up space.

Create A Backup Policy

Unstructured data can cause backup and recovery issues for organizations that don't prepare ahead of time. When deciding what types of unstructured data to back up, Goodall says to profile information sources in terms of risk or value. "We can look at certain information sources and say these things are records, which we need to retain for compliance purposes because they're related to HR, financials, or environmental compliance."

Prioritizing data will also help determine where those unstructured data backups should go. "For a lot of organizations, if it's a record, then you probably want to maintain it on a fairly robust piece of infrastructure," he says.

Properly Secure The Data

Unstructured data is not only difficult to locate and manage, but it also can create some security challenges. For instance, users can store information on their laptops or in personal email folders, which are difficult to view from an IT administrator perspective.

When it comes to personal email folders, Dayley says that companies can actually "turn off the ability for users to create PSTs, so they're not able to put them on their laptop or shared drive." As an extra layer of security, he says, companies can lock down applications, so users "can't actually move data out" or you could use virtual desktops to store data locally and provide "agnostic access through any device, laptop, or mobile."

Security policies also need to be tailored to unstructured data, especially in situations where file sharing services are used.

Goodall says that employees will sometimes ask why they can't use file sharing sites and while "it might make sense for a certain project, IT is completely out of the governance loop." Because the IT team has no management over the service itself, "there is no control around recovery and very poor auditability in cases of litigation." In other words, he says, if your employees want to use file sharing, you may need to develop your own internal system to prevent them from taking advantage of public alternatives. P

No All-In-One Fix Exists

There isn't an all-in-one system that will help overcome unstructured data issues. "Some people think they need this big tree-oriented classification scheme like the Dewey Decimal System for their enterprise documents, but that's an incredibly difficult process," says George Goodall, senior consulting analyst at Info-Tech Research.

Instead, Goodall recommends that companies simplify the process. "It's easier to say, 'let's drill this down to who are our key users and what are our key needs and start from there'," he says. "The reality of these things is that it's very organic, and by the time you bring in this all-encompassing system, your users, business, and information will have changed."

BONUS TIPS:

Don't Spend The Pain Away

George Goodall, senior consulting analyst at Info-Tech Research Group, stresses that "you can't CAPEX your way out of this [unstructured data] problem." It's much more important to focus on strategies, policies, and procedures and to "profile your information sources" to determine their "risk or potential value to the organization." You may discover that you already have the means to organize and protect your data after you find a way to better visualize it.

Remove Repetitious Data

Redundant data is another issue that many companies face when it comes to an overabundance of unstructured data. Goodall says this type of data can cause situations where "people are using the wrong version of a document, using data documents, or simply making errors." This is a great use case for data analysis tools because you can locate repetitious data, determine its value, and then delete it if necessary.

Cost-Saving Ideas For Unified Communications

Avoid Setbacks That Can Negatively Impact Finances After Deployment

Enhanced speed and efficiency, along with less complexity, are just a few reasons why enterprises embrace unified communications. Despite the positives of implementing a UC solution, some enterprises find doing so negatively impacts their finances in ways they didn't anticipate. The following offers cost-saving advice when implementing UC.

Prepare Well

To avoid setbacks that prevent enterprises from leveraging the benefits of implementing a UC solution, Rob Bamforth, Quocirca principal analyst, says you should identify working groups and pilot ideas for which clear benefits and potential champions are recognizable before deploying any technology. After a broader rollout, "foster a collaborative self-help mentality and community spirit," he says.

Some companies do this by conducting "unofficial" soft rollouts to limited teams, which can build curiosity and interest among teams not initially involved.

Tim Banting, principal analyst, collaboration and communications, at Current Analysis, says not having a well-thought-out implementation plan can result in costs escalating.

For example, nearly all UC solutions today run over a company data network, which must be up to scratch—this is the lowest common dominator for every vendor's solution, he says. Thus, there is budget for potential LAN upgrades, he says.

Barry Cousins, Info-Tech Research Group senior consulting analyst, says while UC offers compelling possibilities, "for most people, the dial tone is still critically important."

Ensure network capacity outpaces demands of real-time communications and develop communications-enabled business processes (CEBP) that "make the enhanced communications pay back in the form of tangible benefits, such as lower costs, faster throughput, or improved revenue," Cousins says.

For Jim Rapoza, Aberdeen Group senior research analyst, poor preparation is the biggest issue that derails UC implementations. Some organizations believe they can simply deploy UC and immediately reap benefits only to find their network can't handle real-time voice traffic, their cost-savings expectations were unrealistic, or end users are unhappy. Beyond prep work and testing, monitor and understand current networking and connectivity infrastructures, he says.

If network pipes are already maxed out, for example, expect to make upgrades. Rapoza says there are testing tools that help prep infrastructures to handle the real-time traffic and loads UC introduces.

Avoid Landmines

Assuming all users will adopt and take to UC technology is a common mistake that can impact costs, Banting says. Thus, run trials and audit users first. Additionally, don't assume all users need desk phones, soft clients, or assume other absolutes. Bamforth cautions against deploying end-user technology without first assessing how your users actually work. For example, if they prefer their own devices, investigate if the UC solution can incorporate them.

Rapoza says few technology implementations will impact network performance the way UC does. Unlike email where some lag is OK, he says, "voice and video communication simply doesn't work with lag times and performance issues."

Users that encounter slow or inefficient performance will abandon the solution for alternatives, and your investment will be for nothing, he says.

Cousins says today's business climate puts a premium on a worker's willingness to be interrupted while discounting the value of sustained focus on their work. "An overreliance on UC leverages spontaneity and dilutes the need for people to plan their interactions."

Introduce Training

Tim Banting, principal analyst, collaboration and communications, at Current Analysis, says despite vendor claims that their solutions are easy to use, you need to ensure training is made available to all employees.

Pick & Choose

Eliminating unnecessary UC features can save small to midsized enterprises (SMEs) money and reduce complexity. In fact, Rapoza says, businesses of any size can do without some features, as needs have more to do with communication requirements and culture. "For some, person-to-person video communication will be a must-have. Others will never use it but will leverage videoconferencing," he says.

Banting says SMEs' needs can actually be more demanding than larger enterprises. "SMEs might not know they need contact center functionality but would like a call queuing capability, social media integration, or a single PC-based client. SMEs also need a solution that's easy to administer and manage," he says. "They don't have a large IT team they can train up to support complex systems."

For enterprises with licensing bundles, Banting says, one costly error is assuming all users need all features and opting for premium user licensing packages.

Bamforth says needs will change over time as users become more confident and aware. Don't get locked into a particular approach, technology, or set of end-user devices that prevents change. "The core of UC is unifying the communication around the individual and providing an infrastructure that flexibly delivers," he says.

Mull Your Options

For some companies, free collaboration tools and hosted/cloud-based UC solutions are a good fit cost-wise. Cousins says many smaller enterprises are adopting consumer-oriented communication/collaboration services as their UC offering.

Though they lose some value and control, they save on CAPEX and OPEX, he says. He advises conducting trials to identify needs such services can meet, as well as work practices that could shape decision-making and future investments.

Rapoza says the aforementioned UC solutions can be a very good fit for smaller businesses because they eliminate many infrastructure and deployment worries. This is particularly true of businesses already using a fast Internet pipe and that have a lot of home-based employees, he says. Free consumer-type tools can be a nice supplement to UC systems, he says, though they rarely can fully replace them. The key is ensuring the UC solution can integrate them.

Although free collaboration tools offer benefits, Banting says, they may lack security and compliance levels that other services provide. He also says "hosted or cloud-based services offer a per-user, monthly charge that's easy to budget for and offer secure, reliable services—some with financially backed SLAs." P

Check Everywhere

Aberdeen Group Senior Research Analyst Jim Rapoza says enterprises should investigate all options, including if systems and products already deployed contain collaboration and communications features found in UC solutions. He also suggests looking into third-party systems offered in hosted or as-a-service implementations.

BONUS TIPS:

Make A Case

Info-Tech Research Group Senior Consulting Analyst Barry Cousins says IT should develop a business case that leverages communications-enabled business processes (CEBPs), engage the right stakeholders with well-articulated roles, develop use cases that exhibit process-related benefits, formalize workflows that incorporate new UC features to simplify work, and implement needed infrastructure changes. Migrating infrequent phone users to softphones can reduce hardware, implementation, and relocation costs, he says.

Examine Your Options

Quocirca Principal Analyst Rob Bamforth says despite rapid technology advancements, some forms of communication that have been around a while are still a fit for employees of all ages. Often, he says, companies assume "Gen Y" employees are more flexible than older staff, but "they get set in their ways just the same, only the 'ways' are more recent." Overall, "the cornerstone of any approach has to be strategy. What is the key thing we are trying to achieve?" he says.

Keys To Successful Backups

A Big-Picture View & Willingness To Explore New Technologies Can Help

Backups. Just seeing or hearing the word can often invoke thoughts of headaches and anxiety for data center and IT professionals.

"Backups are the oil changes and lube jobs of the data center—necessary to keep things running well," says Charles King, principal analyst at Pund-IT. "Backups tend to be the job nobody wants." But it doesn't have to be that way. Here are tips and advice from industry insiders that can help improve your backup processes.

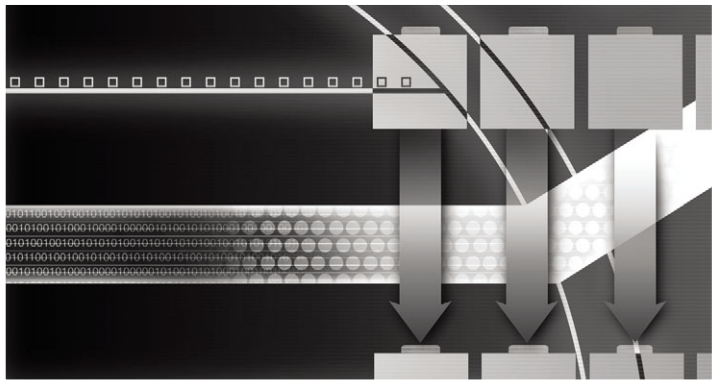
Take A Strategic View

One reason backups continue to be the bane of existence for data center professionals is that they're missing the overall strategic picture, says Mike Karp, vice president and principal analyst at Ptak Associates. "Until recently, very few companies have taken a strategic view toward data, including what is valuable, what isn't, and how best to protect," he says.

"If I were to go in and start an enterprise data center," Karp says, "the first thing I want to understand is the value of the data." By knowing that, you can better allocate resources.

For example, he says, if you have a sales database, that's pretty valuable, while a spreadsheet created by some department running a football pool is not as important. "You have finite IT resources and want to make sure the first one isn't getting the same resources as the second."

You also need to understand the value of data over time. Although data has a life cycle, and most data depreciates over time, that's not always the case, Karp says, so time can't be the only consideration. "You have to really know your data, and generalizations are not that useful."



Also consider the data's value relative to the resources you have and its value relative to other data. "Assuming you understand that really well," Karp says, "there's just never enough time to do things, so you want to figure out the most efficient way to deal with it."

It eventually comes down to a series of service-level agreements, Karp says. How quickly do you have to recover? What level of granularity do you need to recover to?

Look At What You Have

After you know the relative value of your data, evaluate your current polices, procedures, and hardware, King says.

If you haven't recently assessed your backup policies and processes, you need to ensure they still meet the requirements of the business, he says. "Along with that, I'd review the status of the backup environment and how well IT is doing its job," he says.

Don't just assume backup and recovery processes you developed years, or even just months, ago are still the best. "Too many organizations put backup processes in place and then push them out of mind," King says. "With annual data growth averaging around 40% for most businesses, that's a recipe for disaster."

But, King says, don't be in a rush to make a series of changes all at once. "It's not unusual for businesses to panic and try to change everything at once, usually with very poor results."

Invest In Newer Technologies

As you're evaluating the current processes and tools you have in place, look at how new technologies and hardware can improve your backups.

"Start paying more attention to software and less attention to hardware," Karp says. "Management is where most of

Backups In The Future

When it comes to the future of backups, Robert Bready, research director of the IT infrastructure group at Aberdeen Group, says business continuity will play a big role. "It's a global, virtual economy, with demand 24 hours a day, seven days a week, 365 days a year," he says. "Traditional backup methodologies aren't going to cut it."

Bready says a relatively new breed of business continuity appliances let you back up to an onsite appliance, which is then replicated to virtual machines and the cloud. That way, your backups are available both locally and geographically, he says. "It's the way to go for small to midsized enterprises."

the expense is. The more efficiently you can manage it, the more value you'll get out of it.

Karp says one place to start is by getting rid of useless data using data reduction technologies such as deduplication and file compression. "If you reduce the sheer amount of data by getting rid of dupes, you still have same amount of information but less data. That makes things somewhat easier for you because there's less stuff to take care of," he says.

Pund-IT's King says you'll also want to consider solutions that automate processes critical to successful backups. "Effective automation will be key to adapting to data growth," he says.

Karp says automation is "not about laying people off." Rather, through automation, you're able to turn IT around from being a cost center to providing value. "Automation provides an opportunity to capture the best practices of your senior-most people and capture those as a set of policies." Instead of spending their days doing repetitive tasks, employees can focus on higher-value work.

In some cases, equipment upgrades might also be needed. "Add efficiency as equipment in the data center gets long in tooth, and retire it," Karp says. He says some of the newer technologies, such as backing up to disk or even disk-to-disk-to-tape, add tremendous value. "With some equipment, it's cheaper to stop using it and buy new stuff. Everybody always looks at CAPEX, but it's really quarterly OPEX that will kill you."

Test Your Processes

You can have the best backup tools and processes in place, but they're worthless if employees don't know what to do if a disaster happens.

Robert Bready, research director of the IT infrastructure group at Aberdeen Group, says you need to make sure employees can follow your disaster recovery plan. If a critical app or server goes down, how do they get that back up and running? What do they do if a particular staff person is not there?

Bready says Aberdeen Group research found that only 55% of enterprises have a disaster recovery document in place. "Even though they have the technology, they don't have a plan and do not test," he says. "You can back up all you want, but if you don't know the steps to restore that, and you haven't tried it before, you're in trouble."

Karp says the importance of testing can't be overemphasized, and he suggests having junior IT employees do it. "You know that nothing is going to go wrong until the one day that the senior IT guys are all gone. It happens."

Consider The Cloud

When it comes to choosing the best backup system and recovery plan for your enterprise, you don't have to do everything yourself, says Mike Karp, vice president and principal analyst at Ptak Associates.

"If you store something in cloud, that frees you up from a lot of the decisions you have to make," he says. When you enlist the help of a cloud provider, part of the contract and service negotiations covers the level of service, including how quickly you recover and the granularity of recovery. "That may be something that makes sense to hand over to someone who does this for a living," he says.

BONUS TIPS:

Know Your Software

Once you've implemented backup and recovery tools, make sure employees are educated on the particular backup and storage tools that they're using, says Robert Bready, research director of the IT infrastructure group at Aberdeen Group. Then make sure you're using those tools to their full potential, says Mike Karp, vice president and principal analyst at Ptak Associates. For example, he says, "logs are not the most interesting reading material, but if something goes wrong, that will frequently show you what went wrong or what didn't work."

Seek Help From A Vendor

Don't be afraid to enlist the help of your vendor. Karp says when you purchase from a reseller, you get more than just a product or solution. "Engage with those guys," particularly if you have questions or problems, he says. "Along with that relationship you build with a reseller, you get not just a relationship with sales, but with the technical guy behind him. In this case, your sales guy becomes your friend who will go to the tech guy to keep you happy."

What You Need To Know About BYOS

Strategies & Tips For When Employees Bring Their Own Software Into The Workplace

First and foremost, every enterprise employee is a consumer. That's a point research firm Ovum makes in its recent "Future of Work" report outlining enterprise trends for this year. As such, Ovum reasons that the "impact of consumer information and communications will affect even more businesses and institutions as the workforce engages through devices and apps in 2014."

One way this is playing out right now is bring your own software (BYOS), a growing trend in which employees acquire their own software to do their jobs. Although there are benefits to BYOS, there are also worries, including security and data risks. The following explores BYOS and what data center and IT managers should know.

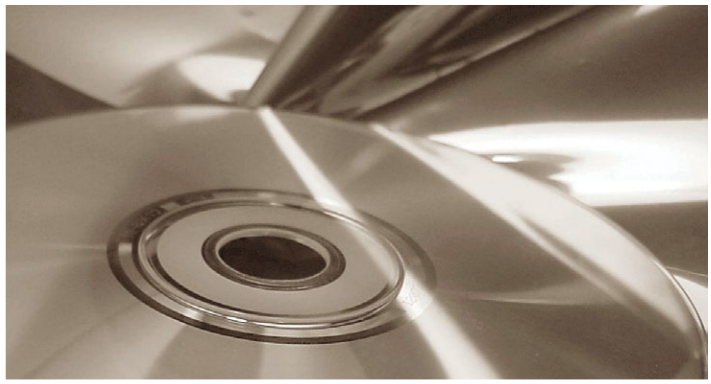
Know The History

Richard Edwards, principal analyst at Ovum, says BYOS actually dates to the 1980s when the arrival of PC spreadsheet and database applications enabled employees to build or acquire business applications the business didn't necessarily manage or formally sanction. Unlike today, the Web wasn't a factor, and business data stayed onsite for the most part.

Eventually, the ubiquity of the Web and business PCs led many organizations to lock down PCs and enact restrictive IT policies, which have partially fuelled today's BYOD/BYOS market and is "a natural response to the beleaguered/overworked employee that's simply trying to get the job done," Edwards says.

Avni Rambhia, industry manager, digital media at Frost & Sullivan, cites image editing software and chat clients as examples of third-party, or "unapproved," software that's long existed.

"It was easier to control for a long time, with enterprise networking, DLP, anti-malware, and Layer 7 monitoring solutions," she says. "At a minimum, the worst offending applications could be kept out. With BYOS, the problem is much more intractable, and this may be why it's getting more visibility."



Ben Dickie, senior consulting analyst at Info-Tech Research Group, says at one time, knowledge workers entering a company were fairly limited to the applications provisioned or imaged on their systems. Now, it is much easier to bring in apps or do such things as add Web browser extensions without gaining administrative permissions.

See The Benefits

Productivity, familiarity, and convenience are BYOS benefits for workers. Collaboration is another. For example, Rambhia says, not every company has a collaboration portal, and some portals companies do have either don't work or don't work well with all tablets and smartphones. As another example, although an enterprise may offer a corporate chat client, it might not support all smartphones. Thus, rather than miss a group conference while away from the office, an employee might install a third-party client that supports connectivity.

Rob Enderle, principal analyst at Enderle Group, says because employees select their tools, they're picking tools they know how to use. Similarly, Edwards says employees generally have a good sense of what their job requires and are well-placed to evaluate the immediate value of independently sourced and easily obtainable devices, services, or computer programs/applications.

Peter Crocker, founder and principal analyst at Smith's Point Analytics, says employees using applications they're most experienced with leads to greater productivity. The vast choice of apps available also lets them choose the newest and most

Differentiate From Bring Your Own Device

The move toward bring your own software (BYOS) is different from BYOD, which was driven by "executives expecting to use the flashy and powerful devices," says Peter Crocker, founder and principal analyst at Smith's Point Analytics. BYOS is more of a grass-roots trend "with employees all over the organization experimenting with new apps." While variables of BYOD are more limited, and the industry is standardizing on iOS and Android, the number of applications employees can bring to work is endless and produces more chaos.

innovative apps that work best for them and how they work.

Overall, much innovation in technology markets originates in the consumer segment "due to the enterprise's adversity to risk," he says. Many consumer-grade apps enter enterprises via newly hired graduates who have limited attachment to legacy software and thrive on trying new things. Enterprises can take advantage of this innovation, he says.

Understand The Downsides

Though the cloud and devices are changing how people think, interact, work, and store data, and companies can be slow to incorporate new technologies for devices, IT is understandably worried about employees downloading apps to corporate-owned devices, Rambhia says.

Data-leakage and security risks include using data files covered under regulations, nondisclosure, or other contracts. Less obvious risks include inconsistent document formats and the need for ongoing maintenance. For example, she says, if a "BYOS title gets locked into company workflow but the vendor and company don't have an SLA agreement, there's a real risk of downtime or data loss should the third-party vendor flounder."

Crocker says in most cases employees don't work as silos. With employees using various applications, "it's difficult to collaborate with co-workers, much less expect IT to support each app." When employees use different file-sharing services, for example, sharing files becomes a new challenge.

Crocker says the enterprise's ability to control and secure data is compromised when employees use applications lacking appropriate security precautions and data is stored on mobile devices and in the public cloud.

What To Do

Crocker says to turn BYOS into an advantage, IT managers must understand what consumer software employees are using and seek ways to support and integrate it. If some employees are prospering using consumer software, it's likely others could benefit from new software and business processes, he says. IT and users, however, must take responsibility for risks and make decisions case by case. For example, storing company data via a consumer file-sharing service is different from using a social network to find new leads.

Dickie says to avoid taking a knee-jerk reaction to BYOS by immediately deeming it a problem and locking it down. Instead, examine the underlying reasons why employees are bringing in apps, he says, which often is because they're not getting the support they need from existing applications or they can't successfully complete their jobs with existing applications.

Rambhia says to acknowledge BYOS is present and ensure employees are well-educated about safe usage and sharing of data. "Security is nearly always a person problem, and it's best solved with person-centric solutions," she says. After discovering what software is installed most often, determine if it can be brought under a company-managed umbrella, she says. P

Do Some Soul Searching

Info-Tech Research Group Senior Consulting Analyst Ben Dickie says senior IT leaders should do some soul searching regarding BYOS to understand why employees bring apps into the workplace. "Where are the gaps in the software we're providing that aren't being met? And then from there, look at sort of formal licensing or formal support of those BYOS-type apps," he says.

BONUS TIPS:

Set Policy

Enderle Group Principal Analyst Rob Enderle says bring your own software (BYOS) is best used in unique situations where a task is tied closely to one employee or a small number of employees. "Policies should be in place to assure the tools and result can be accessed and used if something should happen to the employee, and analysis should be done to assure the tool doesn't create security, interoperability, or continuity problems for the company that exceed its benefit," Enderle says.

See The Angles

Ovum Principal Analyst Richard Edwards sees two angles for enterprises regarding BYOS. One is BYOS being a useful but generic/commodity service for all employees (such as file sync and sharing) that the business doesn't yet provide. The second is BYOS being a useful line-of-business application for employees or tasks that are considered a lower priority when it comes to sourcing or developing an application for them, such as developing an app that enables an engineer to view CAD files on a tablet.

Better Monitor & Manage Remote Sites

Use Available Technologies But Don't Forget The Human Element

Remote sites have opened up new possibilities for organizations that can now expand their business borders while still ensuring all of their employees are connected. And with cloud-based technologies becoming safer and easier to use, more companies are considering opening branch offices both domestically and abroad.

The key to operating a proper remote site is to make sure you have the right amount of control and can fully monitor the facility from the home office. But at the end of the day, it's important to provide the best possible user experience for remote workers and help them be just as productive as their in-house brethren.

Reduce Remote Site Infrastructure

One of the biggest challenges of properly managing remote sites is that maintaining them is "very costly, because you have to have local infrastructure on that site," says John Rakowski, analyst and advisor at Forrester Research. "You have to have local infrastructure to deliver and serve applications and support file and print servers, and all of that is costly not just from an initial purchase perspective, but obviously from an ongoing management perspective."

Fortunately, with advancements around Internet and cloud-based technologies, Rakowski says, "it is now possible to reduce the remote site infrastructure to a bare minimum." He recommends companies take advantage of cloud-based and SaaS solutions to deliver certain applications and adds that even file-based services can be moved to the cloud using file-sharing services.

Mobile Device & Networking Challenges

With "fast-paced technology innovation" offering up "more and more devices for business users," it's important to think about mobile devices when planning out remote site management and monitoring, says John Rakowski, analyst and advisor at Forrester Research. Consider implementing mobile device management (MDM) solutions to help gain more control over smartphones and tablets and plan for mobile device usage when configuring your network. Make sure you have network monitoring solutions both in your central location and your remote sites so you can be sure if anything malicious is happening, regardless of whether the source is a desktop, laptop, tablet, or smartphone.

Rakowski says your willingness to use such technologies depends on your organization and "what regulations and data privacy laws you are facing in regard to the adoption of cloud-based technology." But for those that can embrace the cloud and SaaS, it can save a lot of money and help centralize management of remote sites.

Provide A High-Quality End-User Experience

Whether you choose to handle everything with physical infrastructure or take advantage of cloud-based SaaS solutions to save money, it's important to focus on the end-user experience to make sure those remote workers are productive.

Rakowski says that these delivered applications are tied to business process, so the aim here is to make sure you are detecting end-user experience problems very quickly. Rakowski adds that "using end-user experience monitoring, which comes from technologies that fit into the application performance management solutions, can really help you because they can give you fast warning of any end user affecting issues that are happening at those remote sites."

It's also important to enable what Rakowski refers to as "social support." Remote workers need to have access to knowledgebases so that they can self-serve from a support perspective, he says. This allows the remote site to have some control over the performance of their applications and work together with your monitoring solution to "give the support team early warning of any degradation in the end-user experience."

The Physical Aspect Of Remote Site Management

Darin Stahl, principal consulting analyst at Info-Tech

Research Group, stresses the important of monitoring and management when it comes to repairs. He says it's important to monitor that remote infrastructure but also to have a plan in place for when something goes wrong. You have to decide whether to have in-house technicians actually go out to the site or to outsource those repairs and dispatch technicians as needed.

"Do you have a power user in each office that you talk through things with?," Stahl asks. "Do you go with a managed service and dispatch? It depends on the geography and separation. When I think about school boards, they have roving technicians, but they're all in a singular, easily-gotten-to place. When you're multi-stated, you might not be able to do that, so you'll probably look at outsourcing."

Different Needs Of Central & Remote Sites

Keep in mind when thinking about monitoring and management that the needs of your central site are often different than those of your remote sites.

"The practice usually becomes that the SLAs and service delivery methods I'm using inside the head office also apply to the remote locations, but that may or may not be aligned with what those locations are doing," Stahl says. "Sometimes you have to go back and take a look at exactly what they're doing, the types of workflows, and what the real processes are."

Stahl uses printing as an example. Your central office may use large, managed printers for your in-house workforce, but another group of employees at a remote site may only use one or two unmanaged printers. "Is their printing environment significantly different, and is their workflow environment sufficiently different so that they're putting different demands on file and print?," Stahl asks. "From a head office perspective, you'd think that device being down for a few hours while you try to figure it out isn't a big deal. But it could be mission-critical for that office." P

Be Aware Of Latency Issues

John Rakowski, analyst and advisor at Forrester Research, says that "latency has been a major issue in the past and is probably a major issue still today for enterprises," because "historically, remote sites are connected through a central site or hub site via private WAN links." But he says that the influx of cloud-based and SaaS applications has made it so the only thing you need to worry about is having a fast enough Internet connection at the remote site to eradicate some of these issues.

BONUS TIPS:

SaaS Solutions Expand Your Horizons

SaaS solutions can not only help you increase the distance between your central headquarters and remote sites but also open up your cloud provider options because you don't have to worry about where the provider's data center is located (except for compliance purposes). John Rakowski, an analyst and advisor at Forrester Research, says you don't have to worry about the location of a third-party data center as much anymore because everything is "going over the network." He says that as long as you have the right networking capacity, "the location of the SaaS provider's data center really does not matter."

In-House Or Outsourced Management

It's important to consider outsourcing remote site management if it becomes overwhelming. Darin Stahl, principal consulting analyst at Info-Tech Research Group, says some companies will get so overburdened that they start "duplicating or triplicating" software licenses because they simply can't keep track. Remember that it's possible to push some of that management responsibility to a third party or to the remote site itself. "One of my customers actually put some servers and management toolsets in a super remote office that has other remote offices hung off of it," says Stahl. "They're really managing two sites, but it's kind of a hub and spoke."

Consolidate Data Centers

Maximize Efficiency & Cut Costs Without Impacting Performance & The User Experience

Companies consolidate data centers for a lot of reasons, whether it's to add more capacity, minimize the footprint, or turn two data centers into one.

But perhaps more important than why companies consolidate is how they can go about it so that they don't negatively impact the user experience for employees and customers alike. It's crucial not to over-consolidate, but rather to optimize your equipment as much as possible while still maintaining the proper cooling, energy efficiency, and performance.

Choose A Suitable Approach

Data center consolidation is often an ongoing process, so you should always look for new ways to improve efficiency and save money by minimizing the number of physical resources in your facility. One way, says Rich Fichera, vice president and principal analyst at Forrester, is to make sure you're using your capital resources efficiently, which means implementing server virtualization and standardizing the infrastructure so you can simplify it and manage it better.

There is also the more traditional approach of refreshing your infrastructure by replacing older equipment with newer, more efficient models.

"Five-year-old x86 servers are at least two generations old at this point, and the jump in power efficiency from five years ago to this year is impressive and probably close to double," Fichera says. These more efficient servers make it possible to shrink your required physical inventory and still deliver the same workload, he says. New servers can also help improve cooling efficiency and cut your power bill.

Get Started

Rich Fichera, vice president and principal analyst at Forrester research, says the first step in any consolidation process is to "know thyself." Before you can create realistic goals for consolidation and make sure you provide the right level of performance with fewer physical resources, you have to know where you started. "One of the problems with modern data centers, especially big ones that have grown over time maybe through merger and acquisition, is usually that the asset management picture is fuzzy," he says. "Make sure you know the baseline in terms of power, cooling, and workload fluctuations."

Data center consolidation can even go all the way up to the application level. Darin Stahl, principal consulting analyst at Info-Tech Research Group, says that if you have multiple applications doing the same thing for different lines of business, then you should consider shutting down those workloads and consolidating. "If you have three best-of-breed tools and you're using 20% of all of them, then that's probably not what you want to be doing as a company," he says.

If you aren't able to achieve your consolidation goals even after taking appropriate steps, Fichera recommends looking into colocation, cloud, and hosting services, which he says are now a part of a rapidly growing ecosystem. These services are much more secure and customizable than they have been in the past, which should put them on the radar of companies looking to maximize their efficiency and resource utilization without adding more equipment.

Key Points

- Consider colocation, hosting, and the cloud to add extra capacity without impacting your consolidation project.
- Make sure your facilities and IT teams work together to prepare your data center for consolidation.
- Don't hamper performance and damage the employee and customer user experience by over-consolidating.

IT & Facilities Teams Must Work Together

Throughout the consolidation process, it's important for the IT team, which has the ultimate goal of saving money and getting the same level of performance out of less equipment, to communicate with the facilities team, which needs to focus on power, cooling, and other aspects of the data center facility itself.

Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com), says a company he once worked for wanted to pull equipment from a data center in Texas and move it to a better facility in Minnesota.

Through this collaboration, Koty showed the IT team new things to think about, such as whether the older equipment was dual-corded or capable of handling hot-aisle/cold-aisle cooling methods. Plus, Koty says, the facilities team can provide insight into how much additional equipment the facility can actually handle so the IT team can more accurately determine what equipment to keep and which pieces to throw away.

"Those are some of the things that we talked about as a group before we sat down," Koty says. "I went down there with my people and an IT person. We made a list of everything there. Was IT duplicating anything? Will it fit in our data center? Does it support hot/cold aisle? Is it old? Would it be better to replace with dual-corded equipment to allow better maintenance and uptime? How will it affect IT's growth? Facilities typically doesn't know what IT is planning, so they should meet with facilities and think about these things."

Avoid Over-Consolidation

Stahl stresses the importance of only consolidating equipment and systems that make sense, especially for companies with multiple data centers. It makes sense to deploy your email server in only one location, but you may need multiple deployments of communication and collaboration solutions to make sure you have the best possible performance at each facility.

Fichera says the densest infrastructure isn't always the cheapest. "Density is usually not the problem," he says, so you should focus on optimization, whether it's physical or virtual. "That involves refreshing the infrastructure, increasing your virtualization ratio, and making sure you have the power, cooling, and airflow management under control." Instead of consolidating as much as possible, find out where consolidation makes the most sense and will improve multiple aspects of the business. P

Action Plan

Determine your baseline. Don't start consolidating without first knowing your current state and what goal you hope to reach at the end of the project.

Optimize your infrastructure. Make sure your existing infrastructure is working as efficiently as possible before buying new equipment and adding more capacity. Use virtualization to maximize efficiency.

Refresh your equipment. You may need to buy new energy-efficient servers that pack more compute resources into a smaller footprint. Think about how much capacity you need now and how much you might need in the future.

Consider other avenues. Sometimes physical consolidation isn't enough or you don't want to make changes to your current layout to add capacity. In those situations, you may need to opt for a colocation, hosting, or cloud service.

Top Tips

Consolidation isn't free. Consolidation can cut costs in the long run, but the process isn't free. Darin Stahl, principal consulting analyst at Info-Tech Research Group, warns companies that it does cost to make changes to your infrastructure and says that it's important to "understand how you're going to communicate the change" and help your various IT teams collaborate.

Think outside the box. If you are consolidating multiple data centers into one, don't assume you should move everything to your headquarters. "In some cases, the consolidation takes place in one of the far data centers and they shut down the so-called head office data center because it's 30 years old and it would just be so expensive to bring it up to snuff," Stahl says.

Save money on licenses. If after consolidation you decide to keep a second data center for disaster recovery, consider making it an active-passive arrangement where you might be able to have software loaded up but can choose to activate when you need it, Stahl says. This will prevent you from duplicating licensing costs, but you should only do so if you can still meet your recovery time objectives.

Buying Tips: KVMs

Although some may say that KVMs are dinosaurs from a bygone era, KVMs will continue to play a vital role in many enterprises for the foreseeable future. Here's what to look for the next time you're comparing available options.

Pick A Knowledgeable Vendor

Mike McCurry, product manager for high-performance KVMs at Black Box (877/877-2269; www.blackbox.com), says acquiring sound, objective, experienced technical advice from a leading provider of KVM solutions is the most important aspect of buying KVMs.

Chances are, you don't have the time to learn about all the different KVM offerings, so consider the aptitude of the vendor you work with, says Jeff Clark, president of Lindy (888/865-4639; www.lindy-usa.com), and be transparent about your needs and plans. "A good KVM vendor can help place the right system in your hands, but in order to do that, you must take the time to include this vendor in the initial planning stages," Clark says.

Will Beene, rack specialist and technical account manager at Rack Solutions (888/903-7225; www.racksolutions.com), says you should choose a vendor that you trust and not one that offers just the lowest price.

"Designing a remote access system can be complex and costly, and a vendor that has experience in design, installation, training, support, and service would be the preferred vendor in KVM systems as well as other IT projects," Beene says.

McCurry says one common mistake is purchasing different types of equipment from different manufacturers. "When performing the initial installation and configuration, 90% of these users will realize very quickly that they will have many compatibility issues on their hands," he says.

Check For Quality, Devices, Users & Security

Beene says organizations that are using a range of different hardware and operating systems should consider an enterprise-class KVM switch. "These higher-end switches have the ability to support the different machines as needed. The type of keyboard is the component that can be the limiting factor in some designs."

In terms of the number of KVMs needed, switches are commonly configured in factors of eight, similar to a network switch, he says. "Switches can be connected together to support large numbers of machines, and these switches can be located in different locations on the property," Beene says.

"KVM switches are available that support a single user or multiple users if required. The remote access users are provided with a Web interface that allows the administration of the machines as needed."

McCurry says remote access is particularly important because 24-hour onsite tech support is often cost-prohibitive. "Having the ability to open a browser and remotely access, review, reboot, or update a server without traveling back to the office is a great method of keeping your network healthy and employees happy."

Buying a KVM with secure IP remote user access is essential to reduce manpower and negate the need for onsite operation by enabling admins to gain BIOS-level access to servers, says Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com). A KVM over IP switch uses an encryption protocol that will help secure the data you send over the network.

Determine The Distance

Determine the maximum distance you need to connect devices to the KVM. Yim says CAT 6 KVMs can minimize distance problems; CAT 6 cable with an interface dongle can support up to 130 feet without signal weakness.

"In large organizations with distributed systems, KVM over IP is an easy method of administration and management," Beene says. P

Checklist

Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com), offers this list of features to look for:

- Do you need traditional DB-15 cables or CAT 6 cables with an interface dongle?
- Do you need a single local console or multiple consoles with IP remote access features?
- Will the KVM be standalone or integrated with an LCD keyboard drawer?
- Will you have a single user or concurrent users?
- Does the KVM have multiplatform connectivity so you can mix legacy hardware platforms between DVI, USB, PS2, and Sun solutions?

Buying Tips:

Enterprise Mobile Devices

It wasn't all that long ago that the biggest decisions IT managers had to make about mobile devices were the size and cost of a notebook.

Nowadays, you have to deal with notebooks, smartphones, and tablets that are offered in a range of sizes, with varying degrees of power, and with or without touchscreen compatibility and a host of other features. And employees will often like to have some input on the types of devices they are using, because they are often familiar with the interface and form factor. It all adds up to the need to conduct careful research and compare devices on a number of different fronts before you purchase.

Form Factor

A recent report from Forrester Research, "Orchestrating An Enterprise Tablet Strategy That Drives Business Value," found that there are more than 10 distinct categories of touchscreen devices, including options such as touch-plus hybrids (tablets with dockable keyboards), convertibles (can go from tablet to notebook modes), and miniature tablets—and these are only categories for touchscreen devices.

"There's no hard-and-fast rule, but there are limits to the number of devices people can comfortably carry with them," the report notes. "Does a tablet device supplant (and completely replace) a laptop, or is the worker carrying a laptop and a tablet? This effect varies by industry, occupation, and company (particularly where legacy applications must be used)."

In many cases, this comes down to talking with managers and employees about what types of devices they need and how they'll be using them.

Platform

You also may need to speak to managers or individual employees about the types of tasks they need to perform and what platform will work best.

"If there are critical applications needed for work, they need to be compatible with the smartphone," says Michael Battista, senior consulting analyst at Info-Tech Research Group.

"This is where it becomes more about platform than about the specific phone. A platform with a large app selection will serve a wider range of use cases, regardless of the size of the screen or the clickiness of the home button. This is where iOS has an advantage right now, though Android is catching up quickly."

Service & Support

Ken Dulaney, vice president and distinguished analyst at Gartner, says to look for notebooks and other mobile devices that have solid backing from a reputable vendor with good service and support capabilities. Also, if you'll need them, watch for specific technologies that can be useful in supporting enterprise management and security.

"Don't rely on upgrades, but what you need now," Dulaney says. Another thing to consider when investing in tablets and smartphones is support from the mobile device management (MDM) vendor your enterprise uses, because it will be much more difficult to manage and secure devices that don't conform to your MDM system's capabilities for compliance and corporate policies.

The Extras

Getting the job done with a smartphone or tablet may require some helpful accessories.

"Keyboards, in particular, are often necessary for tablets being used as creation (rather than consumption) devices," Battista says. Some use cases might require other accessories (for example, a cradle for using a tablet as a point of sale terminal, or a thick case to ruggedize the tablet for use in hazardous situations or just to protect it from toddlers when the user brings it home). Make sure the chosen tablet is compatible with necessary accessories." P

Checklist

Talk. Ask workers what mobile devices they are familiar with. For example, it may help if they already own a Windows 8-based PC or an Android or iOS tablet, because they'll be familiar with the ins and outs of how to make it work.

Support. Ensure that any notebook, tablet, or smartphone you purchase can run the applications and mobile apps employees will need to get their jobs done.

Go small. Choose the smallest device that gets the job done. The bigger the device, the less likely the workforce will want to travel with it.

Work all day. Consider how the mobile device will work with monitors and docking hardware, if available, for effective use throughout the workday.

Buying Tips:
Used Equipment

When you're in the market for used equipment, knowing what to look for and whom to buy from can be challenging. Here are some tips to help.

Understand The Testing Process

When a vendor purchases used equipment for resale, a visual inspection and diagnostics test are usually the first steps in the testing process. Technicians ensure that components are complete, that they're operating at the original specifications, and that everything is current and in proper working order.

But other factors can still move items from the refurbish line to the recycle heap. Used and refurbished equipment dealers look for problems such as cosmetic repairs that require too much time to fix or signs of pending equipment failure or tampering.

As a buyer, where applicable, you'll want to be sure the equipment you're buying has been tested and updated with any new BIOS or firmware levels. And whether you're buying equipment from someone else or selling your own, make sure the data has been wiped clean to avoid security breaches and data loss.

Spot The Signs Of Possible Counterfeit Equipment

Hardware is at risk for counterfeiting, especially equipment with recognizable, higher-margin brand names. Counterfeiters don't mind investing more money into making good fakes, and, unfortunately, it's not always easy to spot these fakes.

If equipment is in its original packaging, pay attention to the quality. As always, know who you're dealing with and research the reputation of the company you're buying from, then be sure you know the recourses available should you discover something is counterfeit.

Pay Attention To Part Numbers

Savvy buyers of used and refurbished equipment check part numbers ahead of time, because you don't want to receive equipment that's close to—but not exactly—what you thought you were getting. Check to make sure that components carry only original part numbers, so you know exactly what you're buying.

Know The Warranty & Return Policies

Knowing how a supplier handles equipment returns is an important factor in any purchase decision. Warranties are only as good as the company offering them, so do your homework. Reputable companies provide faster turnaround on advance replacement exchanges, they may waive restocking fees, and they offer better support options.

Also, find out if you'll need to hold on to the original packing material until your warranty period expires. Some suppliers won't accept returns unless they're in the original packaging, while others are less picky. Customers should ask about the requirements when making their purchase so that a return isn't refused because someone inadvertently pitched the original box, for example.

Even if a supplier accepts your returned equipment, you might not get your money back and instead will get a return for credit. If your equipment purchases are infrequent, your money could be tied up until you find something else you need to buy.

Ask For A Trial Period

Inspecting equipment before you buy it can be difficult, but you may be able to get a brief trial period. Be sure to test and inspect the components and contact the vendor if you find any defects. The payment method you choose could also offer safeguards, such as the dispute resolution available through most credit card companies.

Depending on your company's buying position and relationship with the vendor, you may also be able to get a sample piece of equipment. This is often a good route for data centers looking for multiple identical components or considering a shift to a new manufacturer or platform. P

Buying Tips: UPSes

Power outages, spikes, surges, and other power-related problems are bound to happen. Your best protection is making sure your uninterruptible power supply is up to the task.

Start With The Basics

The type of UPS you select is critical to maintaining an effective backup system, says Laura Viars, account manager at Rackmount Solutions.

Three options are standby, line-interactive, and online. Viars says line-interactive UPSes are a common choice. However, "data center managers will want to lean toward online versions; these systems provide the cleanest power, as well as the most reliable continual power since there is no actual switchover involved in the event of a power failure."

Learn Load, Runtime

You need to know the minimum time UPS batteries must provide power and the maximum runtime needed, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). If you have diesel generators, typically 15 minutes of battery backup time is standard.

"If all you're looking for is enough power to allow a safe shutdown, simple inexpensive UPS systems may be just fine. For mission-critical facilities where uptime is paramount, a parallel system utilizing redundant systems, dual bus, or a combination of both may be required," Koty says.

Purchase the right-sized UPS for your needs today. "Too small of a UPS system may need to be replaced as power consumption increases or risk failure; too large of a system is inefficient," Koty says.

Know The Features & Options

The UPS features your enterprise needs depend on the protection level required for given applications. To start with, you need to determine an appropriate UPS configuration, Koty says.

"What type of system will work best at your facility: static or rotary?" With a rotary system that has centrifugal ride-through, Koty says, you will not need batteries. But with a small window of ride-through time, the diesel generators must start or your data center will go down.

"If you have dirty power, you'll want a UPS system that can handle more than just a straight power loss," Koty says. Make sure the UPS can handle spikes, surges, swells, or sags.

You also need to check the efficiency rating of the system, Koty says. Because it most likely will be running 24x7, a system with low efficiency can add up in operating costs over time.

Check For Support & Service

Koty says to compare vendor service and maintenance and check the manufacturer's local reps. "Typically you will want a maintenance contract that will guarantee a 30-minute callback and no longer than four hours to have a person onsite."

Plan For The Future

Don't forget to account for unexpected additions that inevitably crop up. "Make sure the system you buy can either handle the needs of the data center as it will be built out, or make sure that it is modular in design so that, as electrical needs increase, additional UPS units can be installed/integrated without disrupting the existing systems."

If you're buying a modular system, make sure to size the input feeds to your system to accommodate the maximum upgrade size, he says.

Determine Whether It Makes Sense To Buy Used

There are plenty of used and/or refurbished UPSes on the market thanks in part to companies that have gone out of business or upgraded UPSes with useful life left in them. But Darin Stahl, principal consulting analyst at Info-Tech Research Group, says to use caution.

For example, Stahl says, some companies are holding on to their UPSes until the seven-year mark. If that's the case, he says, "Maybe I save some CAPEX, but I more than consume that in OPEX because of efficiency loss if I'm buying used gear." As with any used equipment you purchase, make sure to check the UPSes carefully, including their history, and purchase from a reputable reseller. P

Checklist

Power and load. Determine your uptime goals and the kW load needed. Ensure the UPS you purchase can handle the required loads and that it provides sufficient runtime and capacity.

Available features. Capabilities to look for include UPS configuration, redundancy, and the ability to handle any power anomaly. Don't forget to check the energy efficiency rating of the UPS.

Protection. Determine warranty, insurance, and guarantee requirements available from the manufacturer.

Plan for the future. Make sure the UPS is modular and can be expanded as needed to account for both future growth and unexpected additions.

Network With Your Peers At These IT Training & Association Meetings Across The United States

FEBRUARY

AITP Wheeling
Feb. 12
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Research Triangle Park
Feb. 13
NC State University Club
4200 Hillsborough St.
Raleigh, N.C.
www.rtp-aitp.org

AITP Washington D.C.
Feb. 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Cyber War 2014
Feb. 14
Train Ace Greenbelt
7833 Walker Drive, Suite 520 C
Greenbelt, Md.
www.trainace.com

AITP Lehigh Valley - M2M Technology & Application Solutions
Feb. 19
The Starlight Diner
233 N. Route 100
Allentown, Pa.
www.lv-aitp.org/events.php

Social Engineering & Manipulation
Feb. 24
Train Ace Greenbelt
7833 Walker Drive, Suite 520 C
Greenbelt, Md.
www.trainace.com

Wearables DevCon
Feb. 25-27
San Francisco, Calif.
www.wearablesdevcon.com

AITP Twin City
Feb. 28, 7 p.m.
Ozark House Restaurant
704 McGregor St.
Bloomington, Ill.
www.aitp.org/members/group_content_view.asp?group=75779&id=125369

MARCH

Interconnecting Cisco Network Devices 1
March 7
New Horizons Washington, D.C.
1331 F St. N.W., Suite 420
Washington, D.C.
www.dcnewhorizons.com

AITP Wheeling
March 12
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Research Triangle Park
March 13
NC State University Club
4200 Hillsborough St.
Raleigh, N.C.
www.rtp-aitp.org

AITP Washington D.C.
March 13
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

AITP Lehigh Valley - The State Of IT
March 20
Lehigh Carbon Community College
Community Services Center Ballroom
Schnecksville, Pa.
www.lv-aitp.org
/events.php

AITP Long Island - Careers SIG
March 20
5 p.m.
Carlyle at the Palace
1600 Round Swamp Road
Plainview, N.Y.
www.aitp-li.org/?
q=node/29

Implementing Cisco Intrusion Prevention System
March 17
New Horizons Tysons Corner
2010 Corporate Ridge
Suite 200
McLean, Va.
www.dcnewhorizons.com

AITP Twin City
March 28, 7 p.m.
Ozark House Restaurant
704 McGregor St.
Bloomington, Ill.
www.aitp.org/members/group
_content_view
.asp?group=75779&id=125369

Interop Las Vegas
March 30-April 4
Las Vegas, Nev.
www.interop.com/lasvegas

Big Data TechCon
March 31-April 2
Cambridge, Mass.
www.bigdatatechcon.com

APRIL

2014 High Performance Computing Linux for Wall Street
April 7
Roosevelt Hotel
New York, N.Y.
www.flaggmgmt.com/linux

AITP Wheeling
April 9
White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.
www.aitp-wheeling.org

AITP Research Triangle Park
April 10
NC State University Club
4200 Hillsborough St.
Raleigh, N.C.
www.rtp-aitp.org

AITP Washington D.C.
April 10
Alfio's La Trattorio Restaurant
4515 Willard Ave.
Chevy Chase, Md.
www.aitpdc.org

Women In Cybersecurity
April 11-12
Nashville Airport Marriott
600 Marriott Drive
Nashville, Tenn.
www.wicys.net

Do you have an event you'd like to see listed?
Send an email to feedback@processor.com.

Renovate Your Data Center

Account For Cooling, Fire Protection, Disaster Recovery & Other Considerations

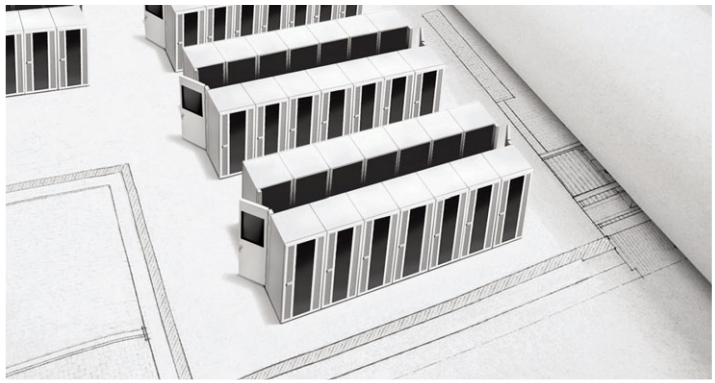
Enterprises undertake data center renovations for a variety of reasons, including equipment upgrades or a complete overhaul to change the layout or overall size.

Renovations provide ample opportunity to look at your entire data center and pinpoint systems such as cooling and fire protection that could use an overhaul. It's important not to limit yourself to the usual suspects but instead think outside the box and improve your data center in ways you may not have previously considered.

Alternative Cooling

A renovation provides the perfect opportunity to look at new cooling technologies and approaches. For instance, David J. Cappuccio, research vice president at Gartner, says some companies may consider whether they can bring in outside air as a cooling mechanism or use outside air as a heat exchange mechanism to reduce cooling costs. But those same data centers may use a renovation as a reason to implement a brand new cooling system.

"With liquid cooling, you have to bring in a cooling distributor on the floor, which is no bigger than a rack," Cappuccio says, so if you're adjusting your room layout, you could make room for a new piece of liquid cooling equipment. Cappuccio says the benefit of implementing liquid cooling is that "when you're done, 95% of your cooling is done with liquid instead of with forced air," which can result in "45% of your total energy cost" disappearing "because you're not cooling all of that IT equipment" with air.



Cappuccio says liquid cooling is much safer than it may have been 20 or 30 years ago when most data centers had mainframes. Most liquid cooling systems use a low-pressure refrigerant that, in the event of a pipe break, will actually turn into an inert gas when it's exposed to the air, he says.

Fire Protection Strategies

Consider your fire protection and suppression system during a data center renovation, says Darin Stahl, principal consulting analyst at Info-Tech Research Group. He says that many companies are paying for extensive dry chemical fire protection systems that are built to "flood the room with chemicals" in order to suppress a fire.

Just as you can use liquids for precision cooling by running pipes through your racks, you can also use a similar approach for precision fire protection by implementing a dry-pipe system inside of closed racks and then utilizing wet misting systems for the rest of the room, Stahl says. If one rack catches fire, you can put it out with targeted suppression instead of blanketing the entire room. This helps prevent unnecessary downtime due to cleaning up dry chemical residue throughout the facility.

Business Continuity & Disaster Recovery

Data center renovations are usually aimed at improving performance or consolidating equipment, but also consider how to protect your business in case of a disaster. "People are starting to tie business continuity and disaster recovery planning into data center strategies, which sounds like an obvious thing, but historically was never done,"

Cloud & Hosted Considerations

With cloud computing and hosted services becoming such a large part of the business world, data centers are finding that their equipment and infrastructure needs are dwarfed by the sheer size of their facilities. "I've been in a data center recently where it all of a sudden had about a third of the equipment and racks in it and three-fourths of the floor was open," says Darin Stahl, principal consulting analyst at Info-Tech Research Group.

That same data center had to put up temporary walls to help with cooling issues, but it still has those systems and power equipment in place, whether it uses them or not, Stahl says. That's why he says it's so important to look ahead at where your workloads will be in the future, even if they're currently in-house. If you plan on taking advantage of infrastructure- and software-as-a-service hosting, then you should take steps now to consolidate your data center.

Cappuccio says. "It was always a secondary project. You created a data center strategy, built the data center, and then somebody got a side project to start deciding what disaster recovery is about."

Now, companies are considering whether they need an offsite data center in addition to their current facility.

This is particularly beneficial during renovations, because you could "free up space or get riskier systems out of the room and put them in the secondary space temporarily," Cappuccio says. But you could also use this secondary, and potentially smaller, facility as "an augmentation strategy" for growth. In essence, a second data center "becomes a workable environment that can be used for both business continuity and migration strategies." You'll always have a facility ready to go, so that even during a renovation, your business will run as usual.

Effects Of New Technology

Cappuccio says that when most data centers start a renovation, they perform a "linear analysis" where they determine how many storage solutions, for example, they have and what their percentage growth is each year. Then, they "extrapolate that over the next 10 years to know how much storage they'll need and how much floor space they need for the racks," he says.

Instead, he recommends companies keep Moore's Law in mind during planning and understand that every new generation of technology is often smaller than the last. "If you apply those generation changes and Moore's Law to growth, you find out that the floor space you think you're going to need is a lot less than you originally planned."

Stahl recommends companies create a technology or infrastructure road map that clearly shows what types of technology the data center should be interested in based on its current and future needs.

He uses the example of solid-state storage, which is "on the tip of everybody's tongue right now." But if your company doesn't currently have a business need for SSDs, then you may not be able to justify the price. Still, you should include solid-state storage in your technology road map, because as the price goes down, it may prove to fit your future business requirements.

The key to getting out ahead of technological innovation is to opt for modularity as much as possible during renovations and retrofits and to also implement solutions with room to grow. P

Seek Expert Advice

David J. Cappuccio, research vice president at Gartner, says that one of the mistakes data centers make during new builds and renovations is relying on their own internal expertise rather than seeking outside help. It doesn't mean that your IT team doesn't know what it's doing with the equipment and the data center in general; it's just that for most of them, it's the first time they've ever done it, he says.

"Go and get some outside expert, an engineering firm or design firm, just to do what's called a data center assessment," Cappuccio says. "They'll come in and tell you what you have now and what you could potentially do with [your data center]." He says that the data center design experts can give you a high-level perspective of your facility's capabilities.

BONUS TIPS:

Avoid A Narrow Focus

Darin Stahl, principal consulting analyst at Info-Tech Research Group, says many data centers will focus on one thing to renovate and "look at it in isolation." The problem is that "the knee bone is connected to the shin bone, and they're all a part of a larger system of delivery and an ecosystem," he says. It's crucial to come up with a list of requirements for your data center as a whole that covers all aspects, because performing one small renovation may not solve all of your problems and could, in fact, cause new ones.

Use What's Around You

Some enterprises prefer to hold on to as many design elements of the current space as possible simply because they are familiar. Although this can be fine in some respects, it can also cause an organization to not adopt changes that would prove beneficial in the long term, such as incorporating green data center design aspects or taking advantage of free-air cooling resources that could reduce power-related cooling costs in certain geographical locations.

PROCESSOR Solutions Directory

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

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BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

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